

Unclassified

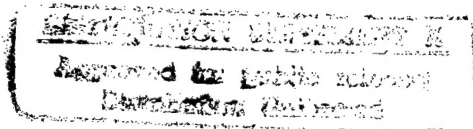
NAVAL WAR COLLEGE
Newport, R.I.

MINE COUNTERMEASURES:
TOMORROW'S OPERATIONS--TODAY'S IMPLICATIONS

by

Gary M. Denning

Maj USMC



A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

19970520 225

17 June 1997

DTIC QUALITY INSPECTED 4

Paper directed by
Captain George W. Jackson, U.S. Navy
Chairman, Joint Military Operations Department

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority: N/A			
3. Declassification/Downgrading Schedule: N/A			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title MINE COUNTERMEASURES: TOMORROW'S OPERATIONS--TODAY'S IMPLICATIONS (U)			
9. Personal Authors: Maj Gary M. Denning, USMC			
10. Type of Report: FINAL		11. Date of Report: 07 February 1997	
12. Page Count: 22			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Mine Countermeasures, mine warfare, Naval Expeditionary Task Force, amphibious operations.			
15. Abstract: Among the most cost-effective weapons available to Third World nations are naval mines. Naval mines provide a small navy with an asymmetrical means to counter a much larger and more capable navy. As the United States discerned during Desert Storm, naval mines, more than any other weapon encountered, had the potential to deny access to U.S. vital objectives, block U.S. naval power projection, and jeopardize the steady flow of sustainment. The U.S. Naval Services and its MCM force took away several lessons learned from Desert Storm. They have since responded to these lessons by restructuring MCM organization and accelerating its research and development for technological improvements. While these are key takeaways, it remains to be seen whether or not the Naval Services learned the most significant lesson: MCM operations will ultimately fail unless considered as a component of the overall campaign or operational plan. The combatant commander has the ability to correct the greatest MCM deficiency of all right now. His greatest asset to minimize the mine threat is his own operational judgment. If naval expeditionary forces are to successfully dominate tomorrow's littorals, today's combatant commander must integrate MCM operations into his standing plans.			
16. Distribution / Availability of Abstract: Unlimited	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

MINE COUNTERMEASURES: TOMORROW'S OPERATIONS--TODAY'S IMPLICATIONS

Among the most cost-effective weapons available to Third World nations are naval mines. Naval mines provide a small navy with an asymmetrical means to counter a much larger and more capable navy. As the United States discerned during Desert Storm, naval mines, more than any other weapon encountered, had the potential to deny access to U.S. vital objectives, block U.S. naval power projection, and jeopardize the steady flow of sustainment.

The U.S. Naval Services and its MCM force took away several lessons learned from Desert Storm. They have since responded to these lessons by restructuring MCM organization and accelerating its research and development for technological improvements. While these are key takeaways, it remains to be seen whether or not the Naval Services learned the most significant lesson: MCM operations will ultimately fail unless considered as a component of the overall campaign or operational plan. The combatant commander has the ability to correct the greatest MCM deficiency of all right now. His greatest asset to minimize the mine threat is his own operational judgment. If naval expeditionary forces are to successfully dominate tomorrow's littorals, today's combatant commander must integrate MCM operations into his standing plans.

MINE COUNTERMEASURES TOMORROW'S OPERATIONS--TODAY'S IMPLICATIONS

INTRODUCTION

"The United States had the fortune to have as an opponent a wolf in wolf's clothing--an unambiguously villainous yet maladroit enemy. Had Saddam Hussein taken advantage of any number of openings between August 2 and January 16, he could have made it difficult if not impossible to wage war against him thereafter...Had Saddam's men continued to roll south in early August we would have had to *fight our way into* parts of Saudi Arabia, not just Kuwait."¹ (Emphasis added.)

By 16 January 1991, the day Operation Desert Storm commenced, an impressive coalition, led by the United States was nearly assured a crushing victory over Iraq. One hundred hours later, it was delivered. The coalition was successful in fighting off every curve ball Saddam could muster. "His threats of massive casualties did not deter us; his taking of hostages did not paralyze us; his prepared defenses in Kuwait did not exact the high toll of Coalition casualties that he expected; and his army was decisively defeated."² From the outset, the coalition dominated every dimension of battlespace...except one.

As overwhelming as this victory now appears, the results prior to 16 January 1991 were not predestined. Although the U.S. military entered Desert Shield with significant material and intellectual advantages, Iraq's geostrategic orientation clearly provided them the early upper hand. In August 1990, Iraqi military capabilities and position afforded Saddam Hussein several options, some which could potentially have raised the price of American intervention to a politically unacceptable level.

Of the military weapons that Iraq possessed, perhaps the most unappreciated were naval mines. As witnessed during the U.S.S. *Princeton's* (CG 59) and U.S.S. *Tripoli's*

¹ Eliot Cohen, "After the Battle," New Republic, 11 April 92, 22.

² U.S. Dept. of Defense, Conduct of the Persian Gulf War (Washington: 1992), xiv.

(LPH 10) mine strikes, Iraq had stumbled upon an asymmetrical means to counter the world's most powerful navy. Ironically, had Saddam been a student of history, he would have appreciated the lessons available some 40 years prior, when North Korea, another country "without a navy," in effect repulsed the amphibious power of the U.S. Navy and Marine Corps. As the United States rediscovered during Desert Storm, naval mines, more than any other weapon encountered, have the potential to deny access to U.S. vital objectives, block U.S. naval power projection, and jeopardize the steady flow of sustainment. Employed properly, naval mines can provide the foundation for an effective coastal defense, crippling the U.S. Naval Services' capability to "win (wars) as quickly and with as few casualties as possible."³

Clearly the U.S. Naval Services require a potent mine countermeasure⁴ (MCM) capability in order to provide protection for its expeditionary forces. Since Desert Storm, the U.S. Navy and Marine Corps have restructured the MCM organization and feverishly sought improvements in an effort to correct technological deficiencies. While many steps have been taken to develop a long-term, MCM in-stride capability, most technological innovations are at least 10 years from introduction into the fleet. Yet technological shortfalls are not the root problem in the U.S. Naval Services' efforts to revitalize its MCM forces. The most significant problem that plagues the Naval Services is a fundamentally flawed concept of MCM employment. The Naval Services have historically treated MCM as a tactical problem involving minefields and breaching devices, rather than as a component of the overall

³ U.S. Dept. of Defense, Joint pub3-0: Doctrine for Joint Operations, February 1995, vii.

⁴ Mine countermeasures refer to all methods for preventing or reducing damage or danger from mines. It includes both offensive and defensive MCM. Offensive MCM are those actions taken to prevent enemy employment of mines in our current and anticipated areas of operations. Defensive MCM are those actions, active and passive, taken to defeat enemy mines already employed in a theater of operations. Unless otherwise noted, for the purposes of this paper, "MCM" will refer to active, defensive MCM.

campaign and operational plan. If U.S. Naval Expeditionary Forces (NEFs) are to successfully dominate tomorrow's littorals, today's combatant commander must integrate MCM operations into his standing plans.

THE THREAT

Rest assured that future adversaries paid close attention to the conduct of Desert Shield and Desert Storm. While Saddam Hussein chose to pit Iraqi weaknesses against U.S. strengths, future enemies will likely pursue a different course.

"Rather than competing head-to-head with the United States in the arena of high-technology weaponry, where Americans have an absolute advantage, a future opponent could seek to couple selected high-leverage weapons with a strategy tailored to exploit US political and military weaknesses. In particular, a regional power may seek technological equalizers, weapons that redress shortfalls in its force posture while also exploiting US vulnerabilities."⁵

Because Desert Storm mine damage occurred while the United States was threatening an amphibious invasion, and the invasion was subsequently canceled, the likely inference is that naval mines proved to be the "technological equalizer" that forced the mission to abort. Third World nations will undoubtedly see this as a valuable lesson and will pursue their acquisition of naval mines as a viable defense against forces arriving "from the sea." It is intriguing to consider that worldwide mine production and demand have increased 50% since the end of Desert Storm.⁶ Increasing a mine inventory should not be a difficult task for a Third World country. Recent estimates indicate

"...that the former Soviet mine arsenal alone includes as many as 250,000 to 450,000 weapons...many of these mines may eventually go to third world states...Add to that a world mine inventory numbering perhaps in the hundreds

⁵ Thomas G. Mahnken, "America's Next War," The Washington Quarterly, Summer 1993, 181.

⁶ J.L. Jones, "Statement," U.S. Congress, Senate, Committee on Armed Forces, Hearing of the Seapower Subcommittee, Hearings, (Washington: U.S. Federal News Service, 1996), 13.

of thousands, held by more than 40 states, and the allied interests comes into sharper focus."⁷

With such a market available, and armed with the supposition that the United States is vulnerable to naval mines, future adversaries are unlikely to replay the 1990-91 Gulf War. Unlike Saddam Hussein, the world's next rogue is likely to be more cautious in preparing for military action, and more forceful in pursuing an initial advantage based on an asymmetrical response strategy. One such strategy would include an all-out attempt to refuse an initial lodgment to U.S. forces. Almost certainly he will take drastic steps to make forced entry an unacceptable risk. Should an opponent choose this strategy, U.S. Naval Forces will be required to rejuvenate their antiquated MCM mind set if they are to successfully fight their way ashore.

THE LITTORAL NAVAL SERVICES

Steering towards a direct collision with the rapidly increasing mine threat, the U.S. Navy and Marine Corps responded to their country's new security environment with the strategic concepts ...*From the Sea* and its successor, *Forward...From the Sea*. The new strategic concept shifted the focus from naval operations on open oceans to operations within the littoral regions of the world--regions that naval mines enjoy their greatest effectiveness. *Naval Doctrinal Publication 1, Naval Warfare*, codified the concepts contained in *Forward...From the Sea* and emphasized the roles and capabilities that NEFs provide combatant commanders. The four critical operational capabilities that NEFs can unilaterally provide are: command, control and surveillance, battlespace dominance, power projection, and force sustainment.

⁷ Frank B. Kelso II, "Building Blocks of Naval Power," U.S. Naval Institute Proceedings, November 1992, 40.

In terms of cost-effectiveness, naval mines would be the single most attractive weapon available to a Third World nation or non-state actor in disrupting NEFs. Naval mines can cheaply disrupt three of the four operational capabilities that NEFs provide: battlespace dominance, power projection, and force sustainment.

Battlespace Dominance: For the Naval Services to perform their full range of capabilities, they must achieve dominance of the air, surface, subsurface, land, and space.⁸ U.S. NEFs have been historically successful in detecting, identifying, and engaging enemy forces within their battlespace, while rapidly achieving air superiority and sea control. Yet these forces have enjoyed much less favor in performing the acquisition-to-engagement functions against naval mines, thereby prohibiting the achievement of "littoral superiority." The failure to counter the mine threat while the NEFs are enroute to the objective area disrupts the agility and tempo intrinsic to naval operations. This loss of tempo and agility limits the operational commander's freedom of action and adversely affects the NEFs from establishing battlespace dominance.

Power Projection: Inherent to power projection is the NEFs' fundamental requirement to provide an offensive military force, available at the time and place of the commander's choosing. The unintended legacy of Desert Saber is the role naval mines played in affecting power projection. While this "non-assault" has since fallen into favor as a "brilliantly conceived diversion,"⁹ a much more telling assessment reveals a significantly reduced capability of U.S. NEFs to project power in the face of a mine threat.

⁸ U.S. Navy Dept., Naval Doctrine Publication 1 Naval Warfare, NDP-1 (Washington: 1994), 63.

⁹ Bernard Trainor, "Amphibious Operations in the Gulf War," Marine Corps Gazette, August 1994, 58.

While the U.S. NEFs are capable of unilateral power projection, their MCM forces provide the functions that enable power projection from *all* the services. Responding to the Iraqi invasion of Kuwait, the first forces in country were the 7th Marine Expeditionary Brigade (MEB) and the 82nd Airborne Division, collectively forming the initial ground deterrent to Saddam Hussein. The equipment and supplies that married up with 7th MEB, initially sustaining the MEB *and* the 82d Airborne Division, transited into the Persian Gulf through the Straits of Hormuz via maritime preposition ships. Immediately behind these forces were Afloat Preposition Force (APF) ships from Diego Garcia, carrying key early deliveries of ordnance for *U.S. Air Force* strike aircraft. The effects of even a few mines, placed in strategically important ports or straits, would have delayed the introduction of *all* U.S. forces and crippled the *entire* U.S. military's rapid response, power projection capability.

Force Sustainment: Facing built-up U.S. combat power ashore, Third World nations must look towards asymmetrical means to pursue victory. While not likely to affront U.S. power projection forces directly, these nations may find the Combat Logistics Force a more vulnerable and potentially lucrative target. With 95% of all material supporting future regional conflicts going by sea,¹⁰ the potential effect of naval mines is crystal clear. With most of the heavy equipment and supplies arriving in merchant or commercial shipping, neither of which incorporate passive MCM, the requirement for a robust MCM force is even clearer.

Any interruption in the sustainment of U.S. forces may reduce the operational commander's ability to maintain tempo. By directly attacking U.S. force sustainment, a cunning opponent creates a dilemma for the operational commander; he slows down the tempo of U.S. forces, while simultaneously bringing additional pressure on the operational

¹⁰ J. M. Boorda, Mine Countermeasures—An Integral Part of our Strategy and our Forces, Navy White Letter (Washington: U.S. Dept. of Navy, 1995), 1.

commander to comply with the "American way of war"--quick decisive victories with few casualties. As Secretary of the Navy, Dan Kimball noted in 1952, "Victory is won or lost in battle, but all military history shows that adequate logistic support is essential to the winning of battles." Victory and force sustainment are interdependent, and force sustainment is dependent upon the U.S. Naval Services effectively countering the mine threat.

RESPONDING TO THE THREAT

"When you can't go where you want to, you haven't got command of the sea. And command of the sea is the rock-bottom foundation for all our war plans. We've been plenty submarine-conscious and air-conscious. Now we're going to start getting mine-conscious--beginning last week."

Admiral Forrest Sherman, CNO
October, 1950

In an effort to redress MCM shortfalls "discovered" during Desert Storm, the U.S. Navy and Marine Corps set out to make sweeping changes to its MCM capability. In January 1992, based on an analysis of the lessons of the Gulf War and other post-World War II mine crises, the Chief of Naval Operations approved a plan that set out to revitalize the Navy's mine warfare forces. The result of this effort was the Navy's initial *Mine Warfare Plan*. Two years following the initial plan, the Navy published its second edition. This edition tracked the progress of the initial plan and addressed weaknesses found during government-contracted studies. The second edition furthered the progress of its predecessor and identified the technological requirements to bring MCM into the 21st century.

Although the *Mine Warfare Plans* have already provided a significant return on investment, its shortfalls nonetheless remain. Among the most critical shortfalls are:¹¹

¹¹ U.S. General Accounting Office, Navy Mine Warfare: Budget Realignment Can Help Improve Countermine Capabilities, Report to the U.S. Congress, Senate (Washington: 1996), 3-22.

- The U.S. Navy will remain unable to conduct *in-stride* MCMs for at least 10 years.
- The U.S. Navy's and Marine Corps' ability to clear mines and obstacles in the very shallow water will remain a *time consuming process*.
- The U.S. Navy is currently *unable to deploy rapidly* its total MCM force from the United States to the area of operation.
- The intelligence effort that the U.S. Navy devotes to mine warfare remains a relatively *low priority*, while surveillance and reconnaissance in support of MCM have received even less attention. (Emphasis added.)

While the combatant commander has relatively no ability to enhance the technological capabilities of his MCM force, he maintains the tools necessary to increase the initial responsiveness and improve the paucity of intelligence and surveillance assets historically dedicated to MCM operations. If the commander approaches MCM as an operational, rather than tactical concern, he will provide the necessary mobility, intelligence, and surveillance assets needed to enable his NEF's ability to conduct battlespace dominance, power projection, and force sustainment successfully.

MCM EFFORTS AND THE OPERATIONAL PLAN

Although designers of 21st century MCM capabilities often focus on technological shortfalls, the most significant problem that plagues the Navy is a fundamentally flawed concept of MCM employment. Historically, the U.S. Navy, upon encountering a mine threat, and having not integrated MCM operations into their overall plan, would sit at idle while waiting for the "9-1-1" force to transit and arrive on station.¹² As a former Chief of Naval Operations criticized: "... we should not have to wait for days or weeks, if not longer, to

¹² Jones, 5.

execute our plans while our dedicated mine warfare forces...make the long transit from CONUS bases to overseas operating areas in order to locate and clear mines."¹³ The operational imperative that emerges is that the commander must ensure that his tempo is sustained by integrating MCM efforts into his plan.

If considered in isolation, current MCM technological shortfalls would preclude the NEFs from obtaining battlespace dominance, power projection, and force sustainment. Yet, MCM operations cannot be considered in isolation. MCM operations must be considered within the overall campaign and operational context, not just as a tactical action involving minefields and countermine devices. Once accomplished, the operational commander can then provide a synergistic mix of MCM-focused functions that build upon each other and enable the capability to counter the mine threat.

Changing the "lone wolf" perception of MCM operations will require the personal influence of the combatant commander. The tools necessary to ensure the right mix of MCM-focused functions rest with him. The manner in which the combatant commander ensures that the MCM plan is integrated into standing plans is by prioritizing intelligence, surveillance, and strategic lift assets.

Intelligence: As much as any other tool that the combatant commander can manipulate to solve the MCM integration problem, intelligence will pay the greatest dividends in the countermine effort. The combatant commander has a formidable intelligence collection, analysis, and dissemination capability at his disposal. Ensuring MCM operations support standing plans will require him to balance strategic intelligence ends and means. If the combatant commander is to integrate MCM operations completely into these plans, he must

¹³ Boorda, 2.

improve the anemic peacetime strategic intelligence support that the MCM community has historically received.

Drawing intelligence assets away from "higher priority" functions will mark a significant divergence from U.S. Naval history. According to the past chairman of the Defense Science Board, "intelligence and surveillance are the two most important missions of the Post Cold War world. The mine warfare community, however, has placed intelligence at such a low priority that it has been surprised by nearly every encounter with mines."¹⁴ The intelligence effort supporting MCM operations during Desert Storm received even worse critique:

"Because a lack of focused intelligence on the mine threat, the extent and sophistication of Iraq's mine laying efforts remained unknown until after the Iraqi surrender, when Iraqi charts showing the location and types of mines were found...Significantly, our intelligence showed no established fields--only a drifting mine threat--elsewhere in the northern Persian Gulf."¹⁵

The data base on enemy mining capabilities that strategic intelligence can provide is the starting point from which MCM integration takes shape. With this data base in place, a focused and productive surveillance effort can commence.

Surveillance: While providing for an integrated MCM plan, the second tool that the combatant commander has at his disposal is surveillance. Without the starting point that a focused intelligence process provides, cost-efficient surveillance is impossible. Just as intelligence assets are at a premium, surveillance assets will also need to be prioritized by the commander. However, with a clear intelligence picture as a starting point, the surveillance effort will be more succinct and yield better results.

¹⁴ Lee M. Hunt, "Instride," U.S. Naval Institute Proceedings, April 1994, 59.

¹⁵ Scott C. Truver, "Exploding the Mine Warfare Myth," U.S. Naval Institute Proceedings, October 1994, 37.

Similar to the dearth of strategic intelligence historically dedicated to MCM, surveillance assets have been found equally in want. During Desert Storm, the results of not prioritizing surveillance assets in support of MCM operations ultimately led to \$85 million worth of damage to the *Tripoli* and *Princeton*. Yet this was preventable:

"Between August 1990 and February 1991, we allowed the Iraqis to lay about 1200 mines in the water off the coast of Kuwait without closely watching the mine laying operations. We knew they were mining the northern Persian Gulf--we had imagery of ships loading mines in port, these ships leaving port and returning without the mines but did not track where the mines were laid."¹⁶

Given the competing priorities for premium surveillance assets, commanders will need to be creative in balancing ends and means. Yet, as illustrated by our experience in Desert Storm, the ability to conduct the necessary surveillance is not beyond his grasp:

"Regardless of the methods we intend to use, we need surveillance and reconnaissance to find out where the minefields are and the types of mines that are in them. The good news is that we already have many of the systems needed to gather this information. We just need to use what we have more effectively. We have a considerable joint surveillance capability. A great shortcoming of our MCM operations in the Gulf War was that we did not exploit that capability."¹⁷

MCM Responsiveness: The third manner in which the combatant commander can integrate MCM operations within the operational context is by influencing MCM responsiveness. Transportation of surface MCM forces from Ingleside, Texas into the area of operations is a tedious process. With a self-sustained schedule of advance (SOA) of 8 knots,¹⁸ the only responsive manner in which surface MCM assets can arrive in country is by a government-contracted, commercial, heavy-lift ship. This option, although the most

¹⁶ Center for Naval Analyses, Naval Studies Group, Naval Mines: Show-Stoppers or Speed Bumps?, CRM 93-94 (Alexandria, VA: July 1993), 7.

¹⁷ Paul G. Kaminski, "Affordable Naval Mine Warfare," Lecture, NSIA Mine Warfare Conference, Arlington, VA: 11 June 1996.

¹⁸ U.S. Navy Dept., Mine Warfare, NWP 3-15 (Washington: 1996), 3-25.

responsive, is deeply flawed. While there only a few heavy lift ships capable of carrying surface MCM assets, none are specifically dedicated to the mission. Exacerbating the problem, once a commercial heavy lift ship is contracted, onload and offload of surface MCM assets requires an additional 10 days.¹⁹

In 1996, the United States Navy attempted to solve the MCM-responsiveness problem by permanently forward deploying four MCM-1 (*Avenger* class) ships, two to the Persian Gulf and two in the Pacific Ocean. Although this is certainly a step in the right decision, this action is at best a cosmetic solution. While the Persian Gulf and Pacific Ocean are areas where naval mines have seen historical use, many other vital areas are equally likely targets. Additionally, during the Gulf War, 36 coalition MCM ships participated in clearing operations. While effective intelligence and surveillance can certainly focus MCM operations and reduce the footprint required, it is unlikely that four, forward-deployed MCM ships--only two of which operate together--will make a decisive impact given the magnitude of the potential threat.

Quick response airborne MCM (AMCM) forces are conceptually the combatant commander's answer to the surface MCM mobility problem. MH-53E helicopters can be rapidly deployed via strategic airlift or via the MCM command, control, and support (M²C²S) ship. However, ensuring the quick response of AMCM forces will require prioritizing strategic lift assets. In early August 1990, military planners realized the likely need for MCM assets in the Persian Gulf and in response, AMCM helicopters were made ready to deploy, awaiting strategic airlift. *Two months later*, they left Norfolk Naval Air Station.²⁰ Upon arriving in Saudi Arabia, they were greeted by the less responsive surface MCM ships which had been in country for 30 days.

¹⁹ *ibid.*, 3-26

²⁰ Truver, 37

The tool that the combatant commander has that ensures surface and airborne MCM responsiveness is the Timed Phase Force Deployment List (TPFDL). Once a contingency involving mine threats is encountered, the combatant commander must balance strategic deployment ends and means. During TPFDL refinement, he must ensure the right mix of forces are in theater at the right time. Although U.S. Marine Corps doctrine may advocate the rapid buildup of combat power, it makes little sense to deploy power projection forces unless the assets that enable that power projection are on station and operational.

TOMORROW'S OPERATIONS

Current MCM operations are limited by the technological shortfalls that prevent a rapid clearing capability. Consequently, a deliberate, overt, and time consuming process is required to clear the way for NEFs. Conducted in this manner, current MCM operations compromise certain strengths inherent to NEFs; specifically, maneuver, speed, and surprise. While ceding the time and battlespace required for MCM operations, NEFs sacrifice tempo and freedom of action.

The success of tomorrow's MCM operations depends largely on the foresight of today's combatant commanders. The same technological shortfalls that prevent the rapid clearing capability today will remain for at least the next 10 years.²¹ If NEFs are to successfully operate within the littorals, commanders will need to look within their own capabilities and create a synergistic mix of MCM-focused operations which build upon each other to provide the capability to counter the mine threat. If today's combatant commander has the foresight to front load the MCM force with intelligence and surveillance assets, tomorrow's operational commanders will have the assets necessary to create that synergy.

²¹ U.S. General Accounting Office, 15.

NEFs do not need to surrender tempo and freedom of action while awaiting the arrival of its MCM assets. The most effective manner to counter enemy mines is to prevent them from being employed in the first place (i.e. offensive MCM.) The ability of the commander to conduct offensive MCM is directly proportionate to the pre-hostility intelligence and surveillance support received. If supported during pre-hostilities, commanders will have the targeting information necessary to strike stockpiles and mine laying platforms. While offensive MCM are the most suitable means to prevent friendly damage from enemy mines, they are only feasible if the commander had the foresight to direct early intelligence and surveillance operations.

As illustrated during Desert Shield, strategic and operational considerations may preclude the suitability of offensive MCM. In such scenarios, NEFs will face naval mines on equal terms. Successful MCM operations will require an aggressive mind set that neither concedes battlespace, nor considers avoidance as the primary means to counter naval mines. These operations are characterized by the synergistic effect of intelligence, surveillance, maneuver, and fires.

The primer for this synergistic effect is the aggressive intelligence and surveillance process that monitors the employment of enemy mines. After monitoring the locations that enemy mines are employed, focused MCM clearing operations begin. To minimize the loss of tempo, commanders should initially clear only the *necessary space* to facilitate naval operations. The integral part of this option is to balance the required space needed to provide the commander *sufficient freedom of action* with the *loss of time and surprise* inherent in MCM operations.

Once MCM operations are perceived by the enemy, every moment of time lost to clearing efforts is to the enemy's advantage. Although unable to recover lost time, actions in support of the MCM plan will reduce its effect. Whereas in the past, NEFs have waited at idle for MCM assets to clear the path (e.g. Wonsan, Desert Saber), future NEFs will not have their hands tied. By orchestrating supporting actions, future commanders can place the enemy in a dilemma. If the enemy chooses to redeploy forces in response to MCM operations, naval expeditionary forces can capitalize on its strengths of surveillance and interdiction capabilities. If the enemy chooses not to respond to MCM operations, the delaying effect of the minefield is minimized and the commander retains freedom of action.

The manner in which the commander decides to counter enemy mines will be chosen after careful evaluation of his mission, constraints and restraints, enemy capabilities, and friendly forces assigned. Regardless of how he attacks the problem, the commander can counter enemy mines in a more suitable, feasible, and acceptable manner than has been done in the past. However, unless today's combatant commander respects naval mines and provides his MCM forces with necessary intelligence, surveillance, and strategic lift assets, tomorrow's operational commander will be unable to dominate the littoral battlespace, project power, and sustain forces.

CONCLUSION

"... I believe there are some fundamentals about mine warfare that we should not forget. Once mines are laid, they are quite difficult to get rid of. That is not likely to change. It is probably going to get worse, because mines are going to become more sophisticated."

Admiral Frank B. Kelso, II, CNO
October, 1992

For a Naval Service that provides its nation with battlespace dominance, power projection, and force sustainment, the history of U.S. MCM operations is troublesome. While power projection, in the form of an amphibious assault, was the only U.S. NEF capability that Saddam Hussein denied, the result could have proved far different. Had Saddam better exploited an unappreciated strength against a historical U.S. weakness, our ability to dominate the littorals and sustain forces would additionally have been threatened. Although it was the *Tripoli* and *Princeton* that suffered mine damage, an aircraft carrier or MPS ship could equally have been the victim.

The U.S. Naval Services and its MCM forces took away several lessons learned from Desert Storm. They have since responded to these lessons by restructuring organization and accelerating research and development for technological improvements. While these are key takeaways, it remains to be seen whether or not the Naval Services learned the most significant lesson: MCM operations will ultimately fail, regardless of future technical wizardry, unless considered as a component of the overall campaign or operational plan. The combatant commanders have the ability to correct the greatest MCM deficiency of all right now. They do not need to wait until the latest MCM cure-all arrives to the fleet. While technological advancements will ultimately provide the commanders with an incredible MCM capability, they will not negate the future's mine threat. The combatant commander's greatest asset to minimize that threat *is his own operational judgment*. If NEFs are to successfully dominate tomorrow's littorals, today's combatant commander *must* integrate MCM operations into his standing plans. If he fails to do so, the tomorrow's operational commander needs to hope that he will be provided an enemy who is either ignorant of history or susceptible to a well-executed feint.

BIBLIOGRAPHY

- Blickensderfer, Thomas L. "Amphibious Mines: Silent Enemy of the Landing Force." Marine Corps Gazette, November 1992, 84-87.
- Boorda, J. M. Mine Countermeasures--An Integral Part of our Strategy and our Forces. Navy White Letter. Washington: U.S. Dept. of Navy, 1995.
- Brill, Arthur P. "The Last Twenty Feet." Sea Power, November 1995, 43-46.
- Brown, David K. and David Foxwell. "The Gulf War in Review. Report from the Front: MCM and the Threat Beneath the Surface." International Defense Review, July 1991, 735-738.
- Brown, Larry K. "Mine Countermeasures and Amphibious Operations: A Line in the Sea?" Unpublished Research Paper. U.S. Naval War College, Newport, RI: June 1991.
- Cashman, T. Michael. "Sweeping Changes for Mine Warfare: Controlling the Mine Threat." Unpublished Research Paper. U.S. Naval Postgraduate School, Monterey, CA: December 1994.
- Center for Naval Analyses, Naval Studies Group. Challenges to Future Amphibious Operations: Perspectives From Recent Research. CRM 95-79. Alexandria, VA: April 1995.
- Center for Naval Analyses, Naval Studies Group. Desert Storm Reconstruction Report. Volume V: Amphibious Operations. CRM 91-181. Alexandria, VA: October 1991.
- Center for Naval Analyses, Naval Studies Group. MCM Forces for Major Regional Conflicts. CIM 373. Alexandria, VA: October 1994.
- Center for Naval Analyses, Naval Studies Group. MCM in Kernal Blitz 95. CAB 95-54. Alexandria, VA: August 1995.
- Center for Naval Analyses, Naval Studies Group. Naval Mines: Show-Stoppers or Speed Bumps? CRM 93-94. Alexandria, VA: July 1993.
- Center for Naval Analyses, Naval Studies Group. Rethinking Mine Countermeasures in Amphibious Operations (A Project Culebra Report). CRM 94-186. Alexandria, VA: March 1995.
- Composto, Joseph. "Desert Storm and the Amphibious Assault." Unpublished Research Paper. U.S. Naval War College, Newport RI: May 1991.
- Fanta, Peter J. "Sea Mines and the Operational Level of War." Unpublished Research Paper. U.S. Naval War College, Newport RI: November 1995.

- Foxwell, David. "Naval Mine Warfare: Unfunded and Underappreciated." International Defense Review, February 1993, 125-129.
- Gibbons, William J. "The Future of Amphibious Warfare." Unpublished Research Paper. National Defense University, Washington: 1989.
- Goodman Jr, Glenn W. "Unlocking the Door to the Littoral Battlespace." Sea Power, March 1996, 15-18.
- Goodman Jr, Glenn W. "Breaching Unseen Barriers." Armed Forces Journal International, November 1995, 40-41.
- Hunt, Lee M. "In Stride." U.S. Naval Institute Proceedings, April 1994, 59-62.
- Institute for Defense Analyses. Critical Threat Aspects of Over-The-Horizon Amphibious Assault Operations. IDA Paper P-2762. Alexandria, VA: October 1992.
- Kaminski, Paul G. "Affordable Naval Mine Warfare." Lecture. NSIA Mine warfare Conference, Arlington, VA: 11 June 1996.
- Keller, Stephen H. "What Weapons That Wait?" U.S. Naval Institute Proceedings, October 1994, 44-46.
- Kelso, Frank B. "Building Blocks of Naval Power." U.S. Naval Institute Proceedings, November 1992, 39-44.
- Mahnken, Thomas G. "America's Next War." The Washington Quarterly, Summer 1993, 171-184.
- Melia, Tamara M. "Damn the Torpedoes: A Short History of U.S. Naval Mine Countermeasures, 1777-1991." Washington: Naval Historical Center, 1991.
- Nerhiem, Steven W. "Enabling the Enabling Force: A Naval Mine Countermeasures Force for the Twenty-First Century." Unpublished Research Paper. Marine Corps University, Quantico VA: May 1993.
- Office of the Assistant Secretary of the Navy, Naval Research Advisory Committee Report. Countermining Capabilities for Amphibious Operations (Phase II). NRAC 92-1. Washington, DC: January 1992.
- Record, Jeffrey. "Defeating Desert Storm (and Why Saddam Didn't)." Comparative Strategy, Vol. 12, 1993, 125-140.
- Robison, Norman J. "Operational Maneuver From the Sea: An Evolving Concept." Unpublished Research Paper. U.S. Naval War College, Newport RI: June 1995.

- Streitz, Joseph J. "Forcible Entry--A Hard Nut to Crack." Unpublished Research Paper. U.S. Naval War College, Newport RI: May 1992.
- Tjepkema, Russell P. "Mines: The Real Threat to 'From the Sea'." Unpublished Research Paper. U.S. Naval War College, Newport, RI: 1994.
- Trainor, Bernard E. "Amphibious Operations in the Gulf War." Marine Corps Gazette, August 1994, 57-60.
- Truver, Scott C. "Exploding the Mine Warfare Myth." U.S. Naval Institute Proceedings, October 1994, 36-43.
- Truver, Scott C. "Weapons That Wait...and Wait..." U.S. Naval Institute Proceedings, February 1988, 31-40.
- Truver, Scott C. "Lessons from the Princeton Incident." International Defense Review, July 1991, 738-740.
- U.S. Congress. Senate. Committee on Armed Forces. Hearings. Washington: S.S. Federal News Service, 1996.
- U.S. Dept. of Defense. Joint Pub 3-02: Joint Doctrine for Amphibious Operations. October 1992.
- U.S. Naval War College. Strategic Research Department. Solving the Mine Countermeasures Problem: A Matter of Focus and Priority. Research Report 1-96. Newport, RI.
- U.S. Navy Dept. Forward...From the Sea. Washington: 1994.
- U.S. Navy Dept. ...From the Sea. Washington: 1992.
- U.S. Navy Dept. Mine Warfare. NWP 3-15. Washington: 1996.
- U.S. Navy Dept. Naval Doctrine Publication 1 Naval Warfare. Washington: 1994.
- U.S. Navy Dept. U.S. Navy Mine Warfare Plan. Washington: February: 1990.
- U.S. Congress. Senate. Seapower Subcommittee of the Senate Armed services Committee. FY 97 Defense Authorization. Hearings (Washington: U.S. Govt. Print. Off., 1996)
- U.S. General Accounting Office. Consolidation at Ingleside Has Not Been Justified. Report to Congress. Washington: 1993.

U.S. General Accounting Office. Navy Mine Warfare: Budget Realignment Can Help Improve Countermining Capabilities. Report to U.S. Congress. Washington: 1996.

U.S. General Accounting Office. The Navy's Plans to Reassign Ships to Ingleside, Texas, and to Consolidate Management. Report to U.S. Congress. Washington: 1992.

Wallace, R.J. "Mine Warfare: Its Implications for the Future of Amphibious Operations." Unpublished Research Paper. National Defense University, Washington: 1993.

Walsh, Edward J. "Navy and Marines Focus on Achilles' Heel: Shallow-Water Mines." Armed Forces Journal International, August 1993, 35-38.

Widmayer, Raymond S. "A Strategic and Industrial Assessment of Sea Mine Warfare in the Post-Cold War Era." Unpublished Research Paper. National Defense University, Washington: 1993.

Wilhelm, Charles E. "Forward...From the Sea: The Mine Warfare Implications." Marine Corps Gazette, July 1995, 23-26.